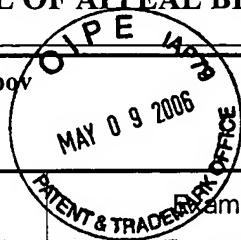


TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
ITO.0554US

In Re Application Of: Ilya V. Karpov



Application No.
10/634,141

Filing Date
August 4, 2003

Examiner
Eugene Lee

Customer No.
21906

Group Art Unit
2815

Confirmation No.
5089

Invention: Reducing Parasitic Conductive Paths in Phase Change Memories

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on
March 24, 2006

The fee for filing this Appeal Brief is: \$500.00

- ☒ A check in the amount of the fee is enclosed.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 20-1504
- ☐ Payment by credit card. Form PTO-2038 is attached.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.


Signature

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Dated: May 5, 2006

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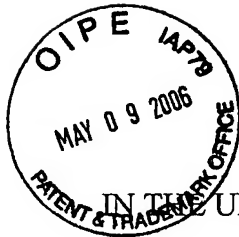


Signature of Person Mailing Correspondence

Nancy Meshkoff

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Ilya V. Karpov

Serial No.: 10/634,141

Filed: August 4, 2003

For: Reducing Parasitic Conductive Paths
in Phase Change Memories

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Art Unit: 2815

Examiner: Eugene Lee

Atty Docket: ITO.0554US
(P16589)

Assignee: Ovonyx, Inc.

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APPEAL BRIEF

Date of Deposit: May 5, 2006

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REAL PARTY IN INTEREST

The real party in interest is the assignee Ovonyx, Inc.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 1 (Rejected).

Claims 2-3 (Canceled).

Claims 4 (Rejected).

Claims 5-7 (Canceled).

Claims 8 (Rejected).

Claims 9 (Canceled).

Claims 10 (Rejected).

Claims 11-31 (Canceled).

Claims 32-37 (Rejected).

Claims 1, 4, 8, 10, and 32-37 are rejected and are the subject of this Appeal Brief.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1, *inter alia*, calls for forming a heater with a sidewall space and removing an upper portion of the heater to form a gap.

In the following discussion, the independent claims are read on one of many possible embodiments without limiting the claims:

1. A method comprising:
forming a pore (Figure 2, 18, specification at page 3, lines 15-20) in an insulator (Figure 2, 14);
forming a sidewall spacer (Figure 2, 24, specification at page 8, lines 1-6) in said pore;
forming a heater (Figure 2, 11a, specification at page 8, lines 7-14) in said pore with said sidewall spacer;
removing an upper portion of said heater to form a gap (Figure 4, A, specification at page 8, line 23-page 9, line 3);
filling the gap with a phase change material (Figure 5, 20, page 9, lines 4-9) that extends over said insulator; and
patterning and etching said phase change material over said insulator (Figure 3, specification, page 9, lines 7-9).

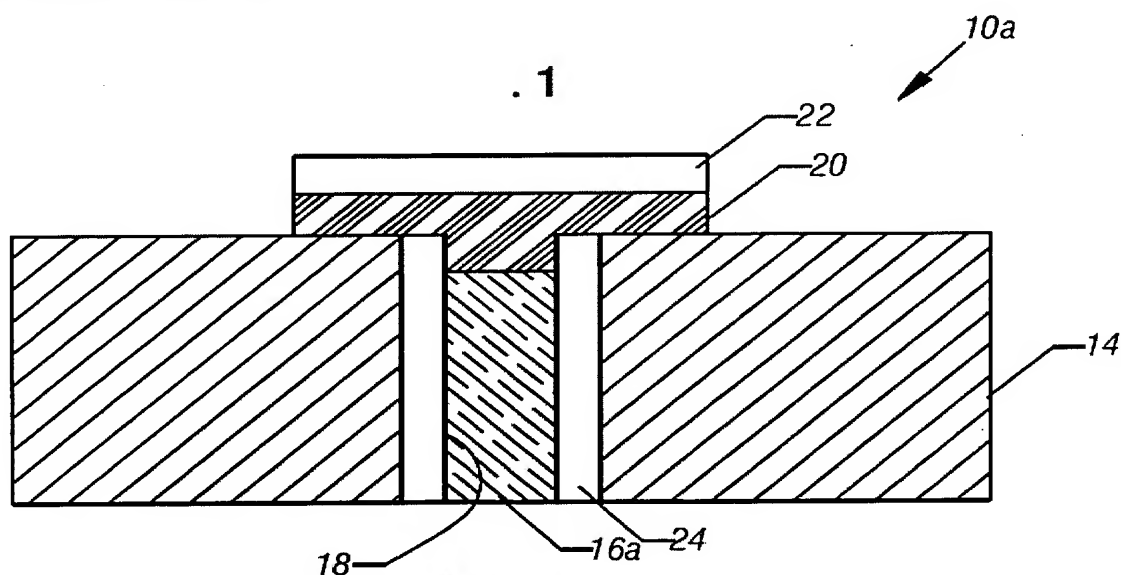


FIG. 2

33. A method comprising:
forming a pore (Figure 2, 18, specification at page 3, lines 15-20), having
sublithographic dimensions, said pore formed in an insulator (Figure 2, 14);
filling said sublithographic pore with a heater (Figure 2, 11a, specification at page
8, lines 7-14);
removing the upper portion of said heater to form a gap (Figure 4, A, specification
at page 8, line 23-page 9, line 3);
filling the gap with a phase change material (Figure 5, 20, page 9, lines 4-9) that
extends over said insulator; and
patterning and etching said phase change material over said insulator (Figure 3,
specification, page 9, lines 7-9).

At this point, no issue has been raised that would suggest that the words in the claims
have any meaning other than their ordinary meanings. Nothing in this section should be taken as
an indication that any claim term has a meaning other than its ordinary meaning.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Are claims 32-37 indefinite for lack of a definition for the word “sublithographic”?**
- B. Are claims 1, 4, 8, 10, and 32-37 unpatentable over Chiang in view of Harshfield in view of Hudgens?**

ARGUMENT

A. Are claims 32-37 indefinite for lack of a definition for the word “sublithographic”?

Dependent claims 32 and 37 call for using a spacer to reduce a lateral dimension of a pore to a sublithographic dimension. A spacer is able to form a sublithographic dimension because it is possible to control the thickness of a deposited or otherwise applied layer to a greater degree of accuracy than one could use lithography to etch such a structure. Thus by precisely controlling the thickness of the deposited spacer, one can precisely control dimensions related to that spacer to a degree greater than is possible with lithography.

The point of the term “sublithographic” is that, inherent in the use of a spacer, is the ability to control dimensions to a greater degree of accuracy than would be possible with lithography. See the specification at page 8, lines 1-14. Thus there is nothing indefinite about the idea of a spacer or its ability to define sublithographic dimensions. Therefore the rejection should be reversed.

B. Are claims 1, 4, 8, 10, and 32-37 unpatentable over Chiang in view of Harshfield in view of Hudgens?

Claim 1, *inter alia*, calls for forming a heater with a sidewall space and removing an upper portion of the heater to form a gap.

By narrowing down the pore using a sidewall spacer, the ability to partially remove the heater by dipping back out or otherwise is enhanced. In other words, the wider the heater, the harder it would be to reduce its vertical thickness because the more material that has to be removed. This is certainly a point which is not immediately apparent.

None of the cited references teach any reason to use a sidewall spacer to enable removing an upper portion of the heater to form a gap.

The references which teach a sidewall spacer for a heater whose thickness is not reduced are really not relevant. Harshfield ‘720 teaches forming the sidewall spacers after you have already removed the portion of the heater 61. Obviously, Harshfield did not realize the benefit of the claimed sequence. Thus, there is nothing that teaches the claimed sequence in order to


facilitate the reduction in thickness of the heater. Therefore, a *prima facie* rejection is not made out.

With respect to the comments concerning Chiang, it should be noted that Chiang teaches selectively depositing the heater 22. This does not teach anything about why it would be better to form the sidewall spacer first or second and why one would want to use a sidewall spacer in connection with the formation of a heater of one thickness prior to its subsequent thickness reduction. Since Chiang is selectively depositing the heater, it does not matter when he forms the heater relative to the positioning of the sidewall spacer. Therefore, Chiang does not teach the claimed solution.

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: May 5, 2006



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CLAIMS APPENDIX

The claims on appeal are:

1. A method comprising:
forming a pore in an insulator;
forming a sidewall spacer in said pore;
forming a heater in said pore with said sidewall spacer;
removing an upper portion of said heater to form a gap;
filling the gap with a phase change material that extends over said insulator; and
patterning and etching said phase change material over said insulator.
4. The method of claim 1 including planarizing the upper surface of said insulator.
8. The method of claim 1 including forming a T-shaped phase change material.
10. The method of claim 9 wherein forming a heater includes depositing metal in said pore after forming said sidewall spacer.
32. The method of claim 1 including using said spacer to reduce a lateral dimension of said pore to a sublithographic dimension.
33. A method comprising:
forming a pore, having sublithographic dimensions, said pore formed in an insulator;
filling said sublithographic pore with a heater;
removing the upper portion of said heater to form a gap;
filling the gap with a phase change material that extends over said insulator; and
patterning and etching said phase change material over said insulator.
34. The method of claim 33 including planarizing the upper surface of said insulator.

35. The method of claim 33 including forming a T-shaped phase change material.
36. The method of claim 35 wherein forming a heater includes depositing metal in said pore after forming said sidewall spacer.
37. The method of claim 33 wherein forming a pore includes forming a trench in an insulator and lining said trench with a sidewall spacer.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.